Alumil SOLAR

H2300-AS116

TECHNICAL MANUAL

Version:05.23

Assembly Instructions

❖ CONTENTS

A. MATERIAL LIST

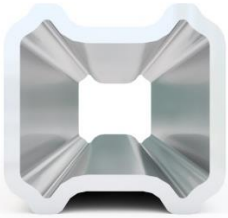
1. Aluminum Profiles

BASE PLATE
(8960280100)

CONNECTOR WITH INCLINED BEAM
(8960950000)

PROFILE: PILES AND INCLINED BEAM

PURLIN



CORE FOR PURLIN

WINDSHIELDS

2. Fasteners & other accessories.

➢ Accessories needed to mount the profiles

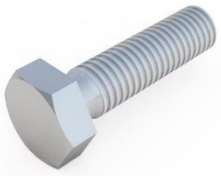
HEXAGON BOLT ISO4017 M10x80 A2 INOX
(7622108001)

SERRATED LOCK WASHER DIN6798-A M10 A2 INOX
(7627301001)

NUT M10 DIN934 A2 INOX
(7628010101)

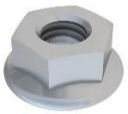
HAMMER HEAD BOLT WITH EPDM M8x22 INOX A2
(8969122081)

SERRATED LOCK WASHER DIN6798-A M8 A2 INOX
(7627300801)



HEXAGON BOLT ISO4017/DIN933 M8x30 A2 INOX
(EX-7622803001)

SELF DRILLING SCREW 6,3x32 A2 INOX DIN7504K
(7626703201)



HEXAGON NUT DIN6923 M8 WITH SERRATION INOX
(8968808201)

COMPRESSION PLATE SMALL 40mm
(8960260000)

END CAP FOR PURLIN-RAL1003 YELLOW
**Size of end cup depends on the purlin profile*

Purlin Profile	***End cap***
H2055	*EX-8960600040*
H2060	*EX-8960600040*
H2070	*EX-8960700040*
H2080	*EX-8960800040*
H2090	*EX-8960900040*

➢ Accessories needed to mount PV panels to the structure

MID CLAMP PANEL
(EX-8960180200)

END CLAMP LENGTH : X mm*
**Height of end clamp depends on the thickness of the PV panel*

SERRATED LOCK WASHER DIN6798-A M8 A2 INOX
(EX-7627300801)

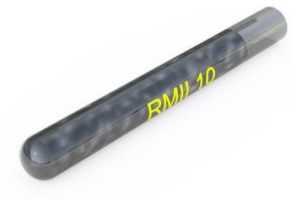
T-SLOT NUT M8 ALUMINUM
(EX-8968008103)

ALLEN BOLT DIN912/ISO4762 M8x'LENGTH INOX A2*'
**Length of allen bolt depends on the thickness of the PV panel*

CAP OF PANEL GRIP WITH 55mm LENGTH
(EX-8960660000)

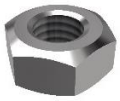
Panel thickness (mm)	***End clamp***	***Allen bolt***
50	*EX-8960330100*	*EX-7629085001*
46	*EX-8960430100*	*EX-7629084501*
42	*EX-8960340100*	*EX-7629084001*
40	*EX-8960440100*	*EX-7629084001*
38	*EX-8960720100*	*EX-7629084001*
35	*EX-8960450100*	*EX-7629083501*
34	*EX-8960460100*	*EX-7629083001*
32	*EX-8960621100*	*EX-7629083001*
30	*EX-8960630100*	*EX-7629083001*

➢ Accessories for anchoring a base in concrete (optional)



RESIN CAPSULE RM II 10
(7300000500)

THREADED ROD RG M10x130
(7300000510)



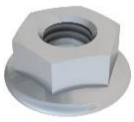
NUT M10

WASHER 10.5

➢ Accessories needed to mount windshields to the structure (optional)

HEXAGON BOLT ISO4017/DIN933 M8x70 A2 INOX
(EX- 8969907081)

SERRATED LOCK WASHER DIN6798-A M8 A2 INOX
(7627300801)



HEXAGON NUT DIN6923 M8 WITH SERRATION INOX
(8968808201)

3. Tooling set

Spirit Level (2m)

String Line

Stell Tape Measure (50 -100m)

Spanners Sockets (Metric)

Tap screw adaptor

Torque Wrench

Screw Rivet Tool

Power Driver & Bits
Impact Driver

Suitable Angular Measuring Device

Health & Safety

It is the installer's responsibility that their personnel ensure that safe working practices as required by the site specific contract are adopted and achieved at all times.
No operation should cause danger to employer, employee, contractor, sub-contractor or any member of the public.

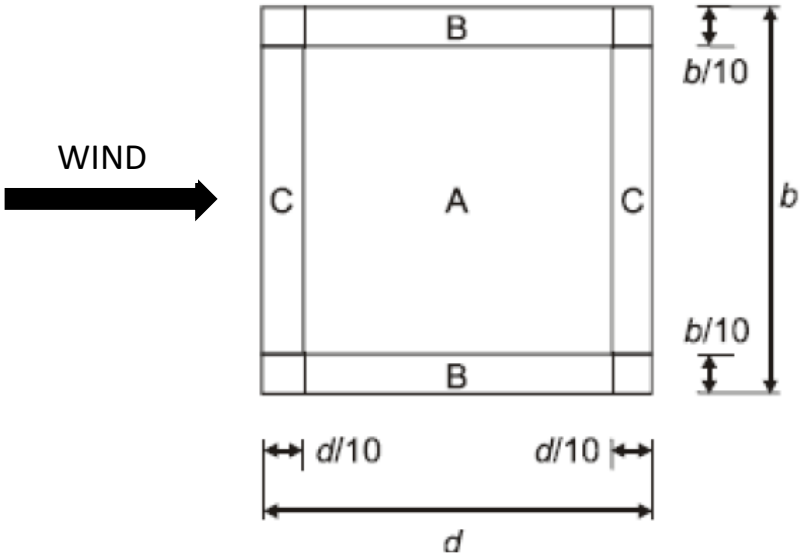
4. Nut's torques

The table below represents the specific torques that should be used for fastening the screws and nut's, according to size (i.e. M8 or M10) and aluminum's finishing (i.e. mill finished or anodized).

SCREW TIGHTENING TORQUES (MILL FINISHED PROFILES)		
M10	**M8**	**M8 Allen**
T=40-45 Nm	T=25 Nm	T = 9 - 10Nm (for thin film panels) T =12-15 Nm (for poly panels)
SCREW TIGHTENING TORQUES (ANODISED PROFILES)		
M10	**M8**	**M8 Allen**
T=50 Nm	T=25-30 Nm	T = 9 –11 Nm (for thin film panels) T =14–17 Nm (for poly panels)

5. Safety zones

Safety distances of 10% roofs length should be kept from all edges of the roofs.
Installation of PV panels at zones B & C should be avoided since wind forces are very high at those zones.

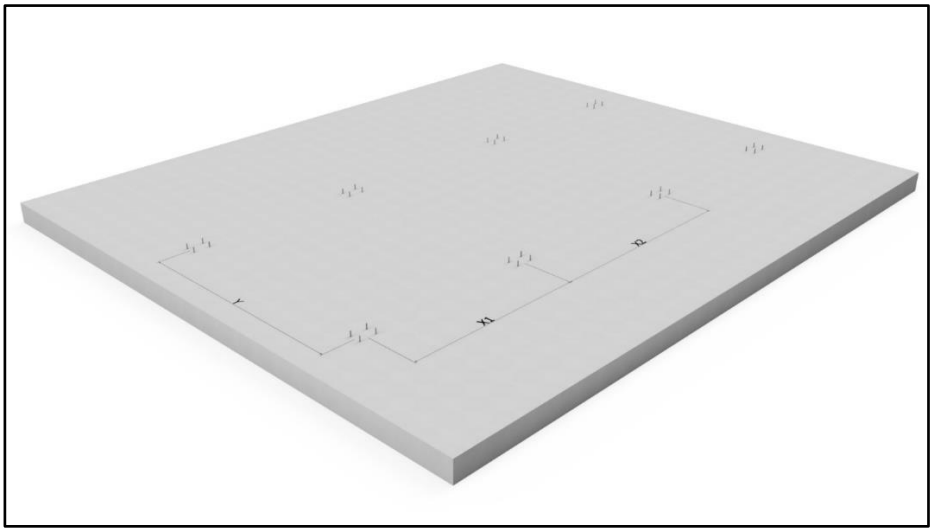


B. ASSEMBLY INSTRUCTIONS FOR AS116

1. AS116

➢ Placing Base Plate

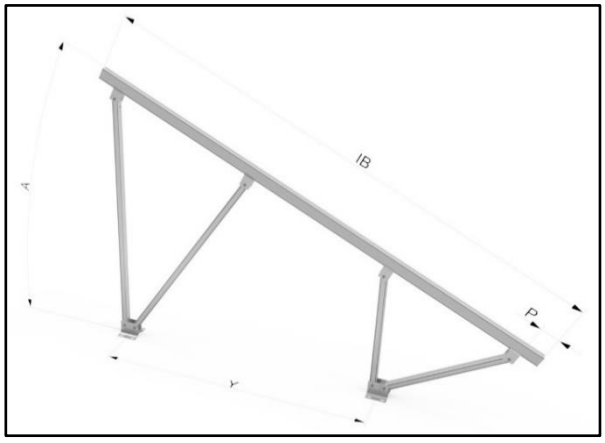
The process for drilling a hole on the roof according to the X1, X2, and Y dimensions is as follows:



1. Determine the X1, X2, and Y dimensions for the hole. These dimensions will vary depending on the specific requirements of the project.
2. Mark the location for the hole on the roof using the X1 and X2 dimensions as reference points.
3. Use a drill with the appropriate size and type of bit for the material of the roof.
4. Begin drilling the hole, making sure to keep the drill level and steady. Pay attention to the drill's speed and pressure to avoid damaging the roof material.
5. Continue drilling until the hole reaches the Y dimension.
6. Stop the drill and inspect the hole to ensure that it is the correct size and shape. If necessary, adjust the hole as needed.

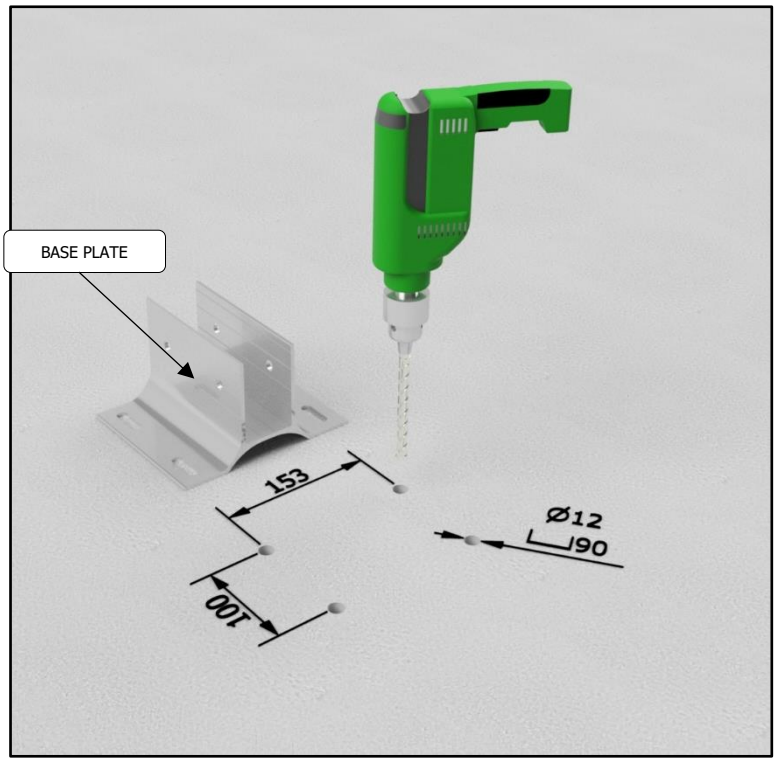
X1, X2 = Distance of horizontal according to order.

Y = Distance of vertical profiles according to order.

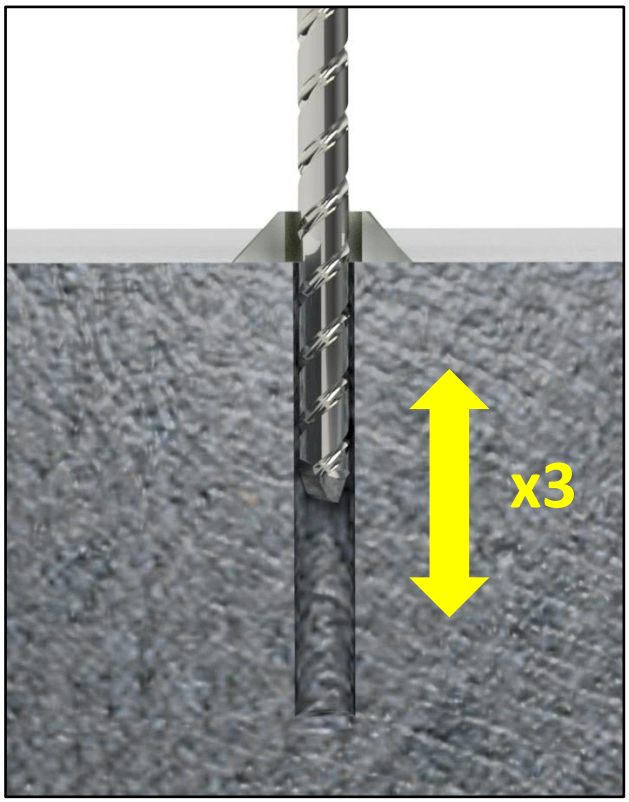


PART NUMBER TRIANGLE	Y (mm)	IB (mm)
8961162510	1650	2850
8961162550	2200	3150
8961163010	1820	2850
8961163100	1830	2850
8961163700	2100	3700

Specified drill hole depth 90mm should be adhered to drill the hole.

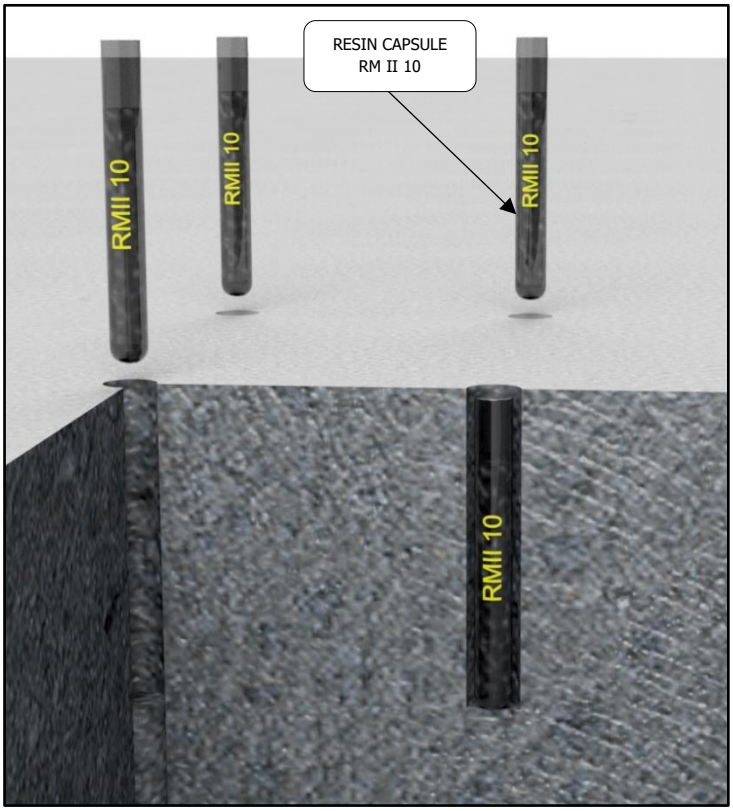


When reaching the drill hole depth 90mm pull out the drill bit whilst power drill is switched on. To reduce the drill dust in the drill hole repeat this step minimum three times, beginning from the drill hole bottom.

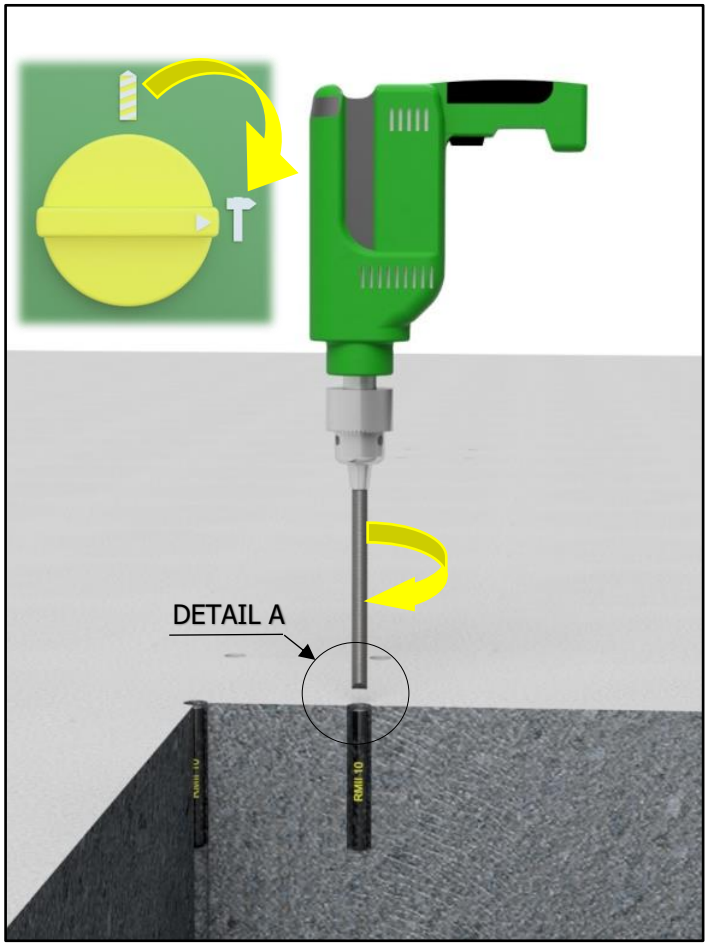


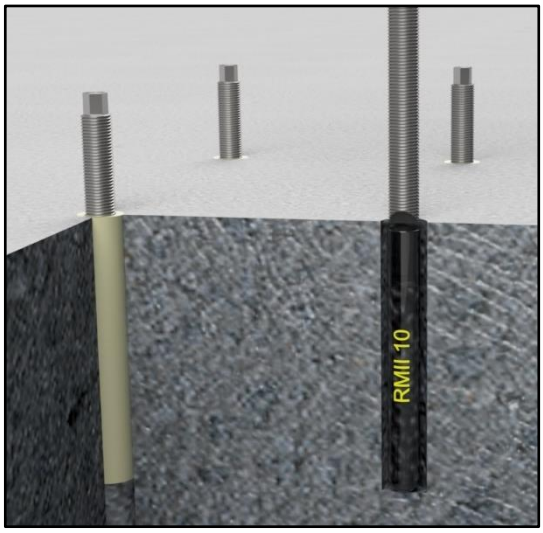
Trickling of the bore dust into the drill hole has to be avoided. (e.g., with exhausting the drill dust). Blowing out or brushing the drill hole is not necessary.

Push the capsule RM II 10 into the drill hole.



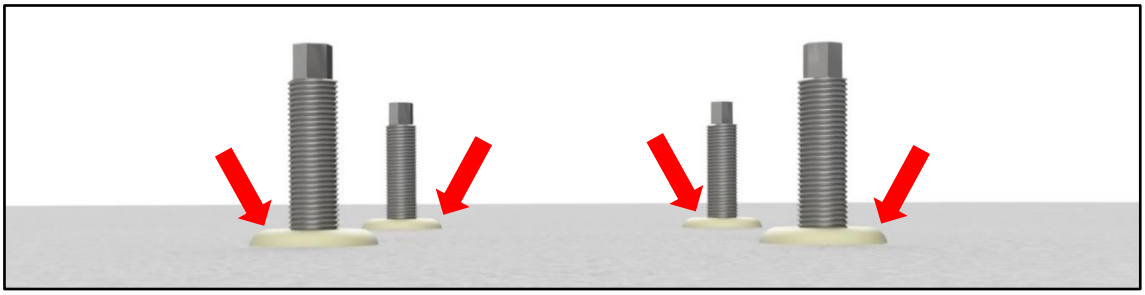
Only use clean and oil free metal parts. Using a suitable adapter, drive the RG M into the capsule using a hammer drill set on rotary hammer action. Stop when the metal part reaches the bottom of the hole and is set to the correct embedment depth.





DETAIL A

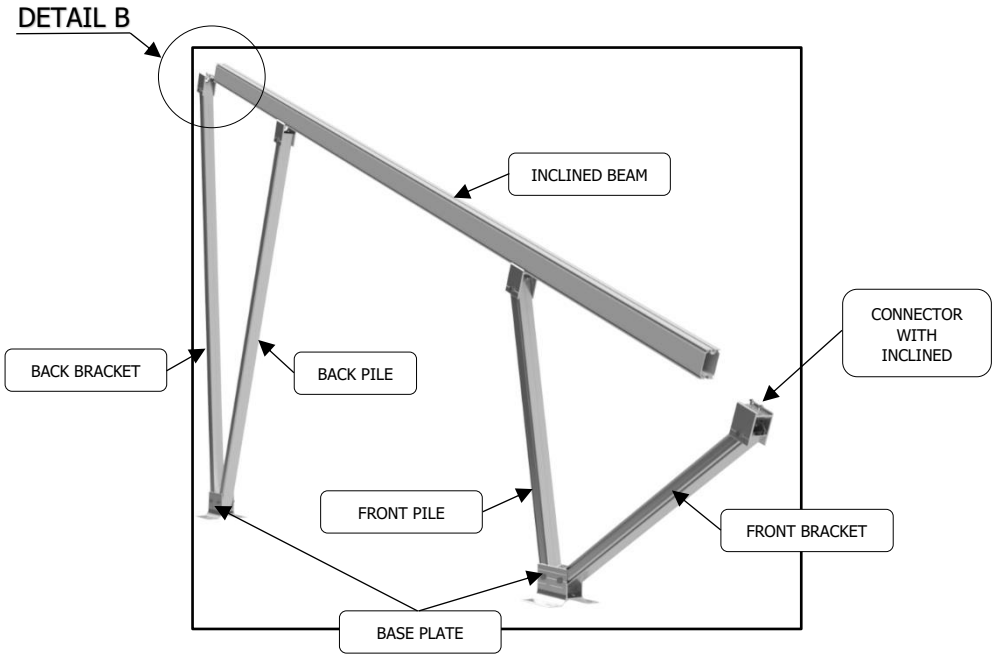
When reaching the correct embedment depth, excess mortar must be emerged from the mouth of the drill hole.



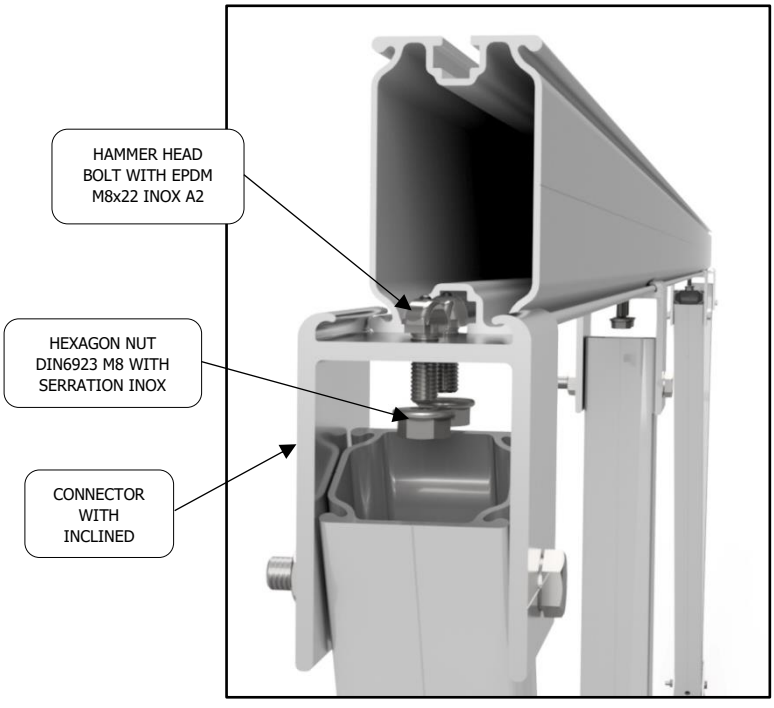
Note: It is important to follow all safety guidelines and wear proper personal protective equipment when drilling holes in a roof. Always consult the roofing material manufacturer's specifications and guidelines before drilling a hole.

➢ Placing inclined beam on piles

After tracing the spots on the concrete blocks where the base plates of the structure should be placed on, connect the inclined beam with the brackets and poles by using the connector and screws M10X80.



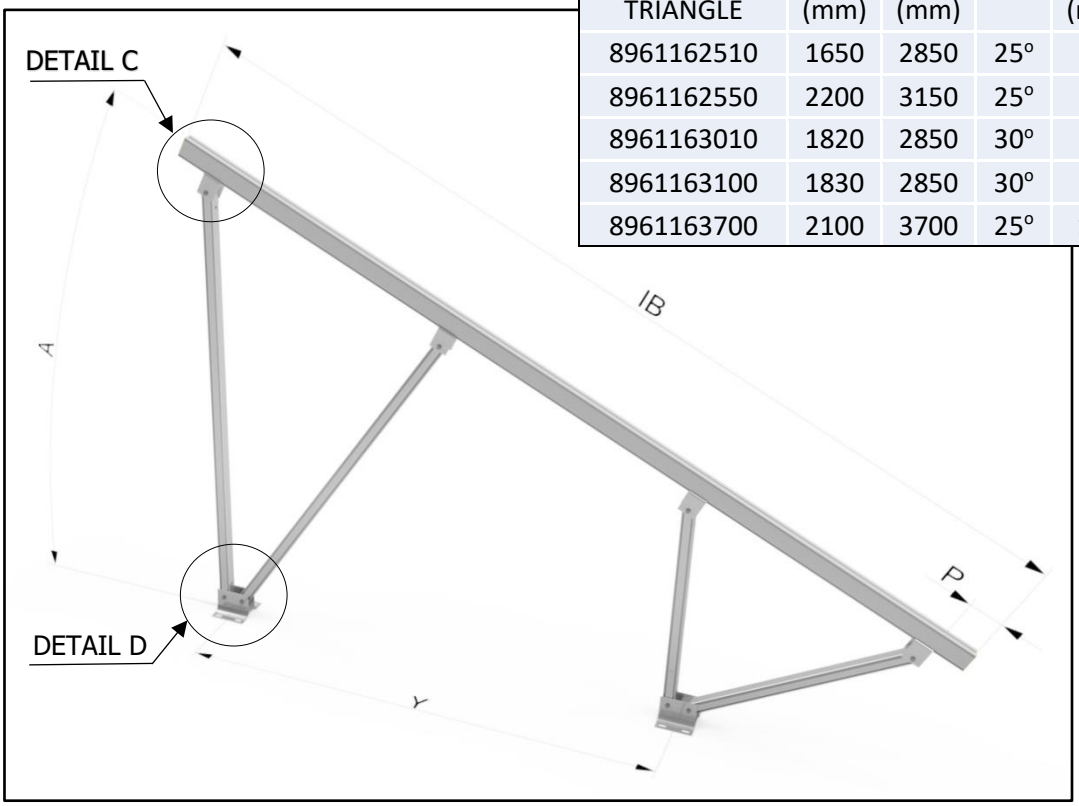
Place the hammerhead screw on the rail and rotate clockwise to lock and use hex flange nuts M8 to fasten all parts together.

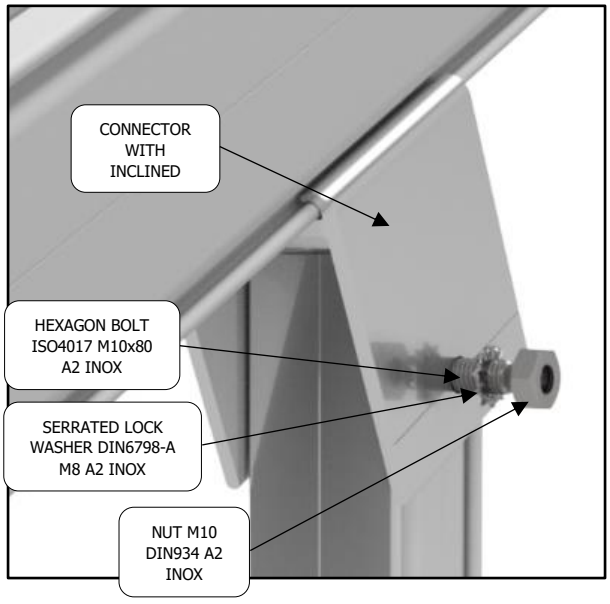


DETAIL B

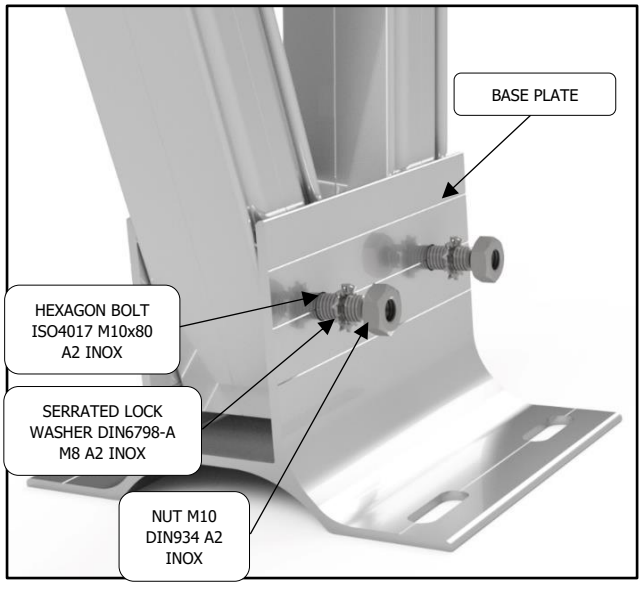
Placing the base plate at the appropriate distance.
Tight the bolts M10x80 that connect the base plates with the poles and brackets, so that every item is stable.

PART NUMBER TRIANGLE	Y (mm)	IB (mm)	A	P (mm)
8961162510	1650	2850	25°	80
8961162550	2200	3150	25°	90
8961163010	1820	2850	30°	60
8961163100	1830	2850	30°	35
8961163700	2100	3700	25°	130





DETAIL C



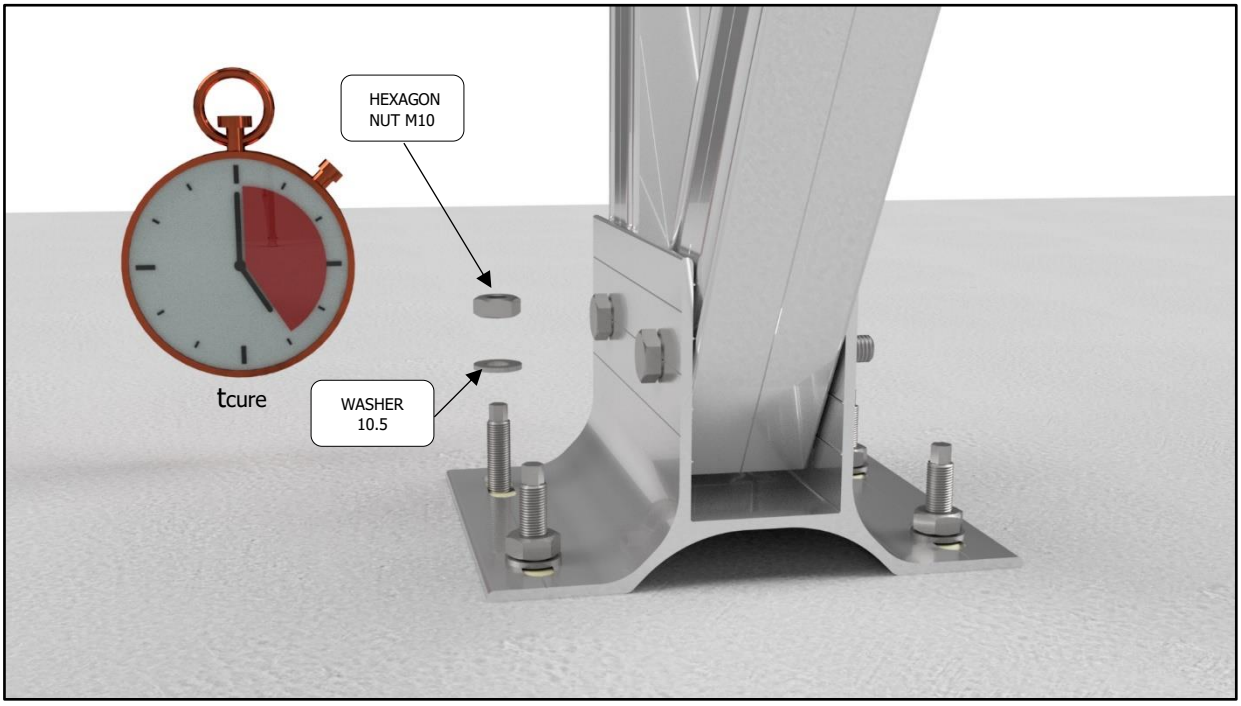
DETAIL D

Wait for the specified curing time:

Concrete temperature (°C)	-15 to -10	> -10 to -5	> -5 to 0	> 0 to 5	> 5 to 10	> 10 to 20	> 20 to 30	> 30 to 40
Minimum curing time (t_{cure})	30h	16h	10h	45min	30min	20min	5min	3min

Mounting the fixture:

Maximum installation torque (Nm)	20

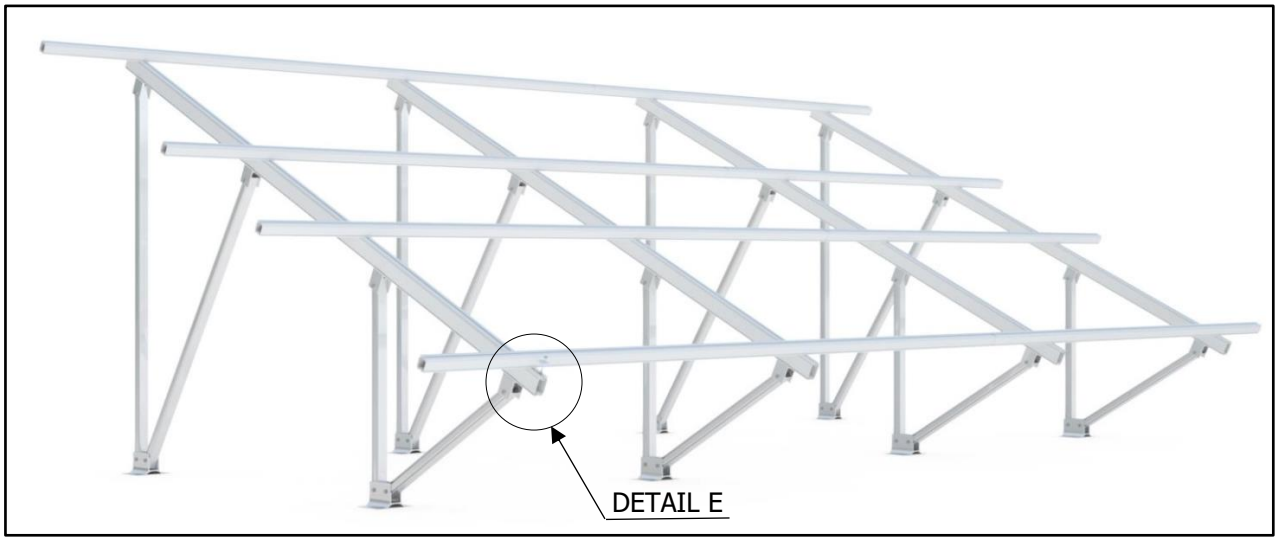


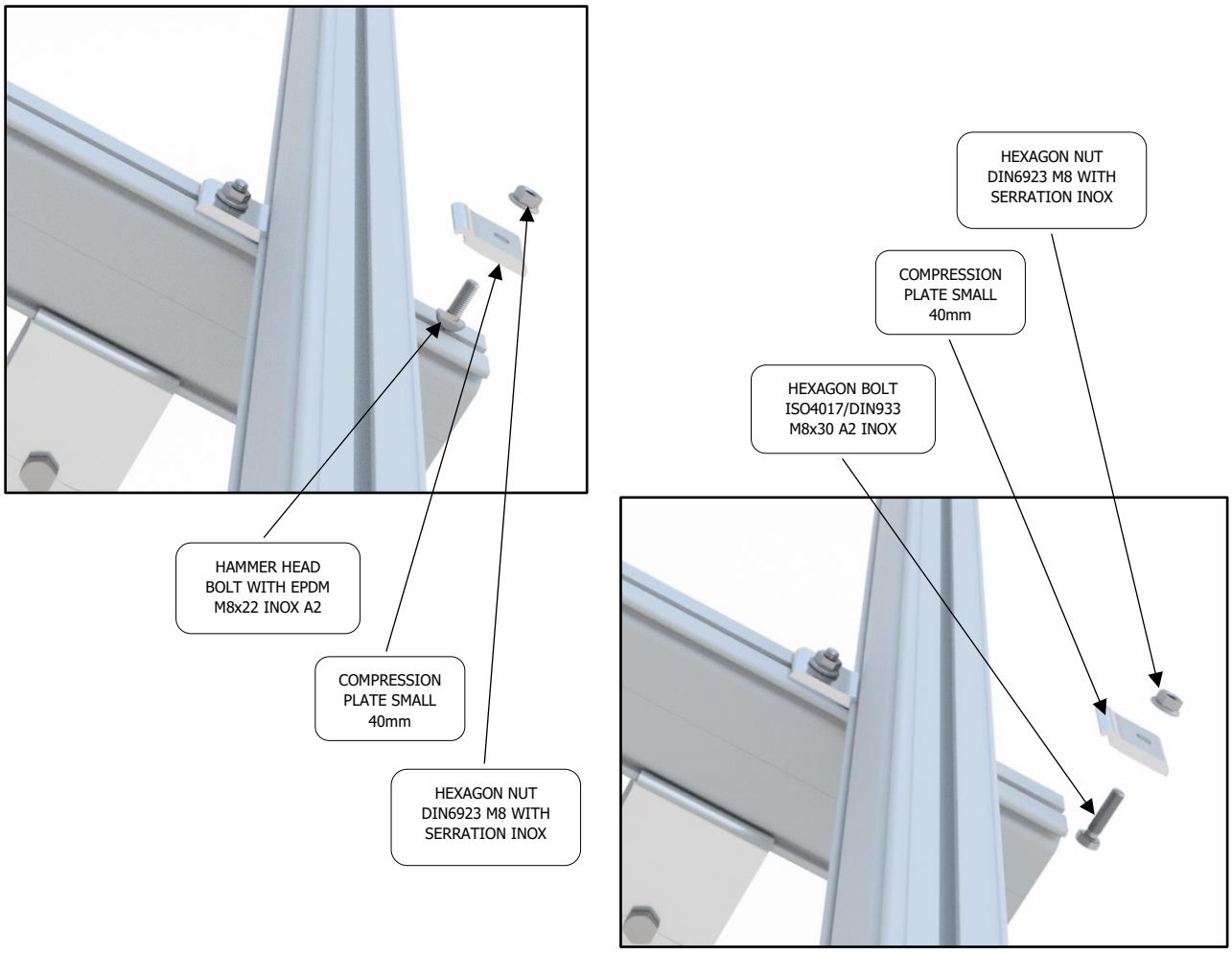
Note:

- Inspect the entire installation to make sure that all components are securely attached and that there are no gaps or other issues.
- It is important to follow the manufacturer's specifications and guidelines for the installation of the inclined beam, brackets, poles, and connector, as these will vary based on the specific application and requirements. Failure to properly install these components can result in damage or failure of the structure.

➢ Placing purlins on inclined beam

Place the purlins at the appropriate distances, according to the manufacturer of the PV module.

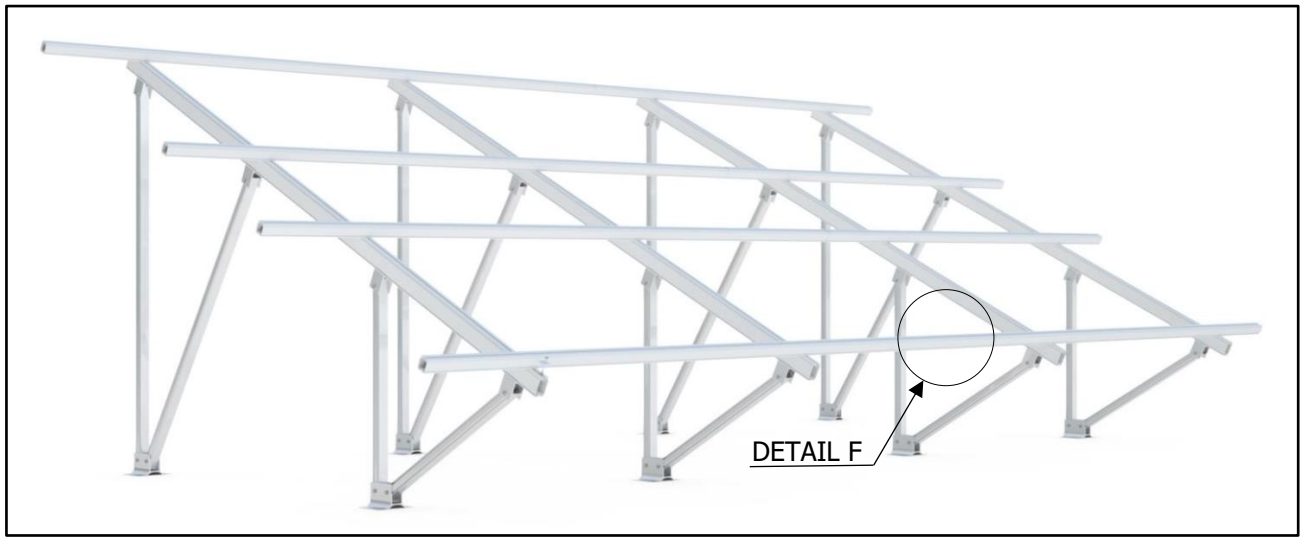




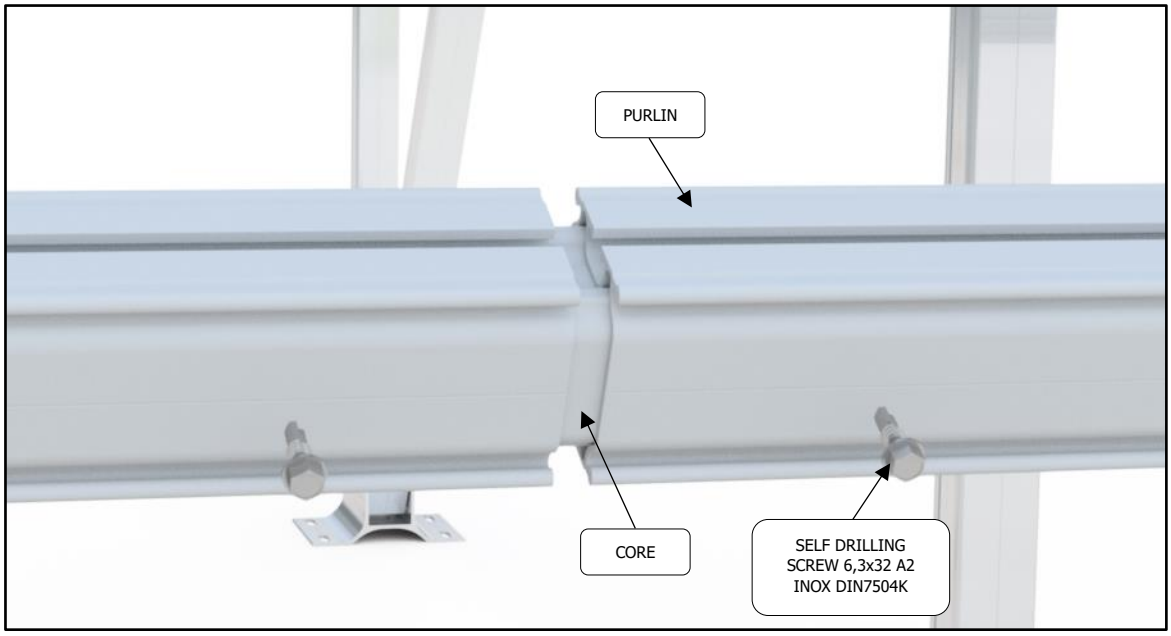
DETAIL E

➢ Placing core

After bases installation, are placed. In their meeting point, the connection should be done with the help of core accessory. Core is used to connect two identical profiles, while helping in the absorption of thermal expansions due to temperature changes.

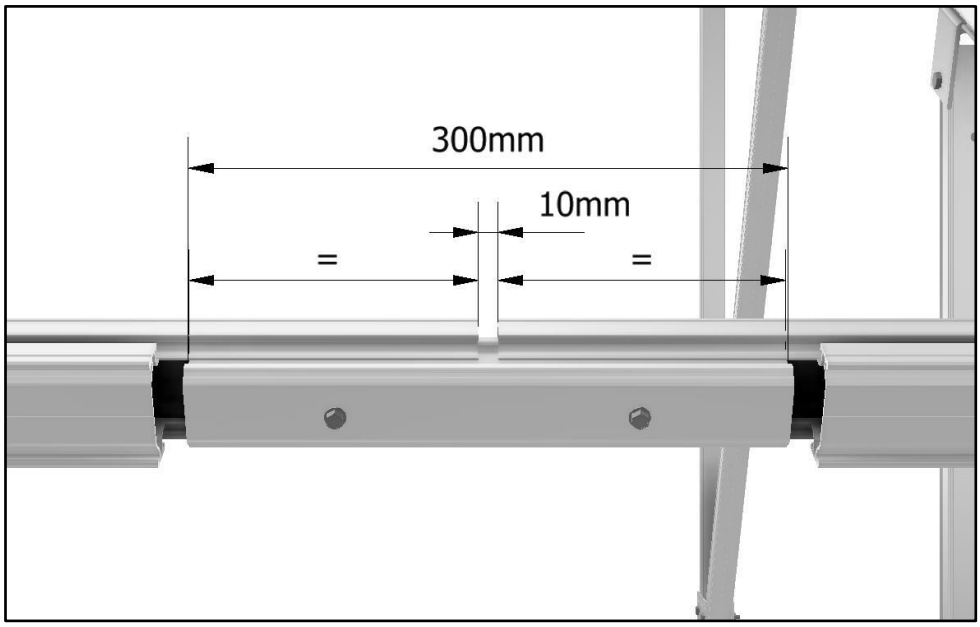


Place the core in the 2 successive profiles and mount with 2 self-drilling screw.



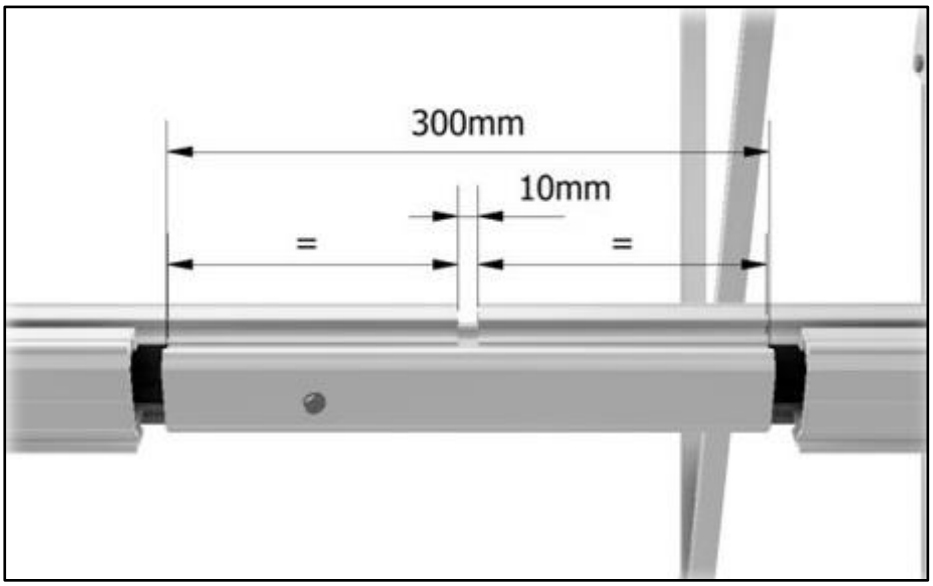
DETAIL F

In tables with a total length less than 40m, fix with 2 self-drilling screws all the cores on the beans.



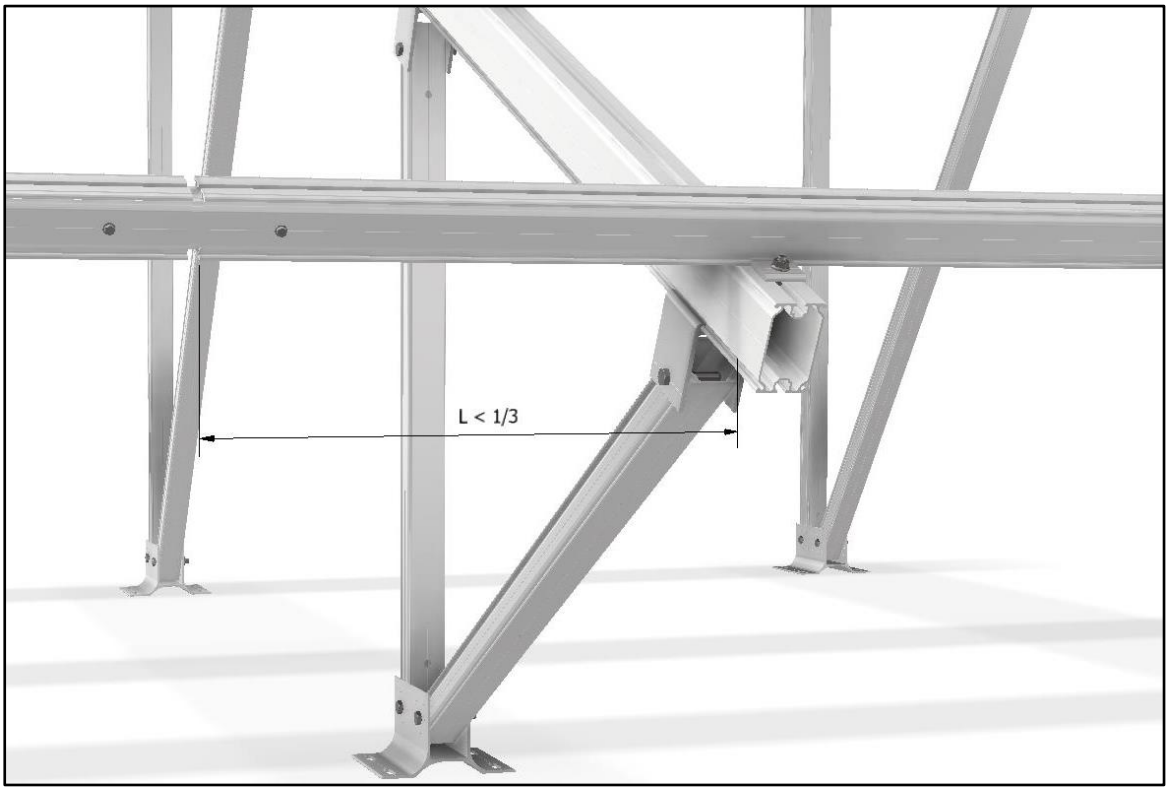
In tables with a total length more than 40m, leave one core free, fix with a self-drilling on one beam.

The rest of the cores fixed normal using two self-drilling screws.



The "free core" must not be located below the panel or in other words, there should not be a panel mounted on two successive beams, which are joined by "free core". Even the "free core" must be located no more than 1/3 of the opening of the triangle.

The maximum length of the table is 60m.

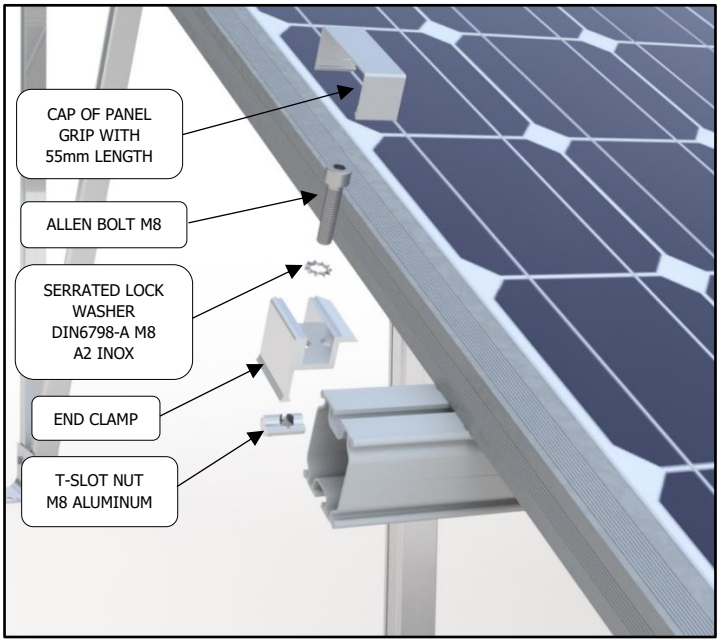


➢ Mounting panel

The process for fixing the photovoltaic (PV) modules with clamps after fixing the purlins is as follows:

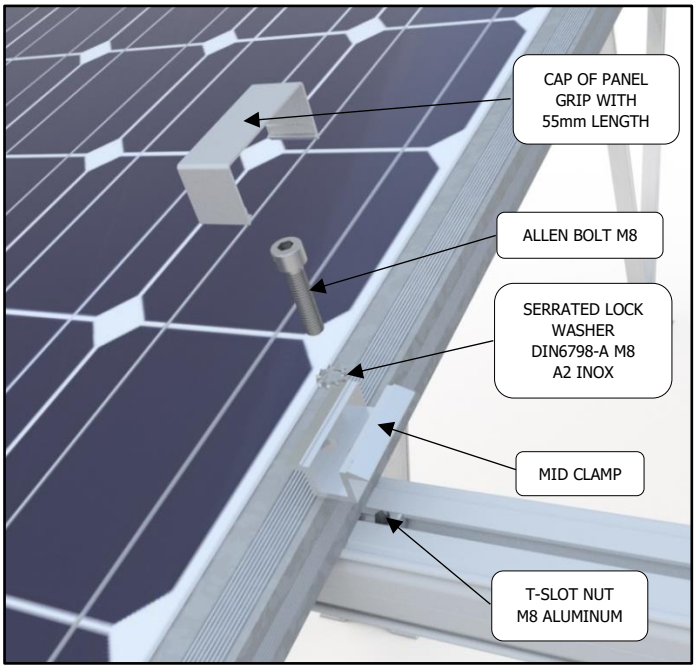
1. Gather all necessary tools and materials, including the PV modules, clamps, and any other necessary hardware.
2. Locate the purlins that have already been fixed in place.
3. Place the clamps loosely on the purlins, making sure that they are spaced evenly and positioned in a way that allows them to be used to secure the PV modules.
4. Begin with the placement of the PV modules on the purlins. Start by positioning the end clamps at the start and end of a line, and then place the middle clamps at all other locations along the line.
5. Secure each PV module in place by tightening the clamps, making sure that each module is securely fastened to the purlins.
6. Repeat the process of placing and securing PV modules along each line, making sure that each module is properly aligned and that all clamps are tightened securely.
7. Inspect the entire installation to make sure that all components are securely attached and that there are no gaps or other issues.

Mount the edge panels onto the purlins using an End Clamp, an M8 Allen Bolt of specified length, a M8 serrated lock washer, and a T-Slot Aluminum Nut.



DETAIL G

To mount two intermediate panels on the purlins, use a Mid Clamp, an M8 Allen Bolt of specified length, a M8 serrated lock washer, and a T-Slot Aluminum Nut.

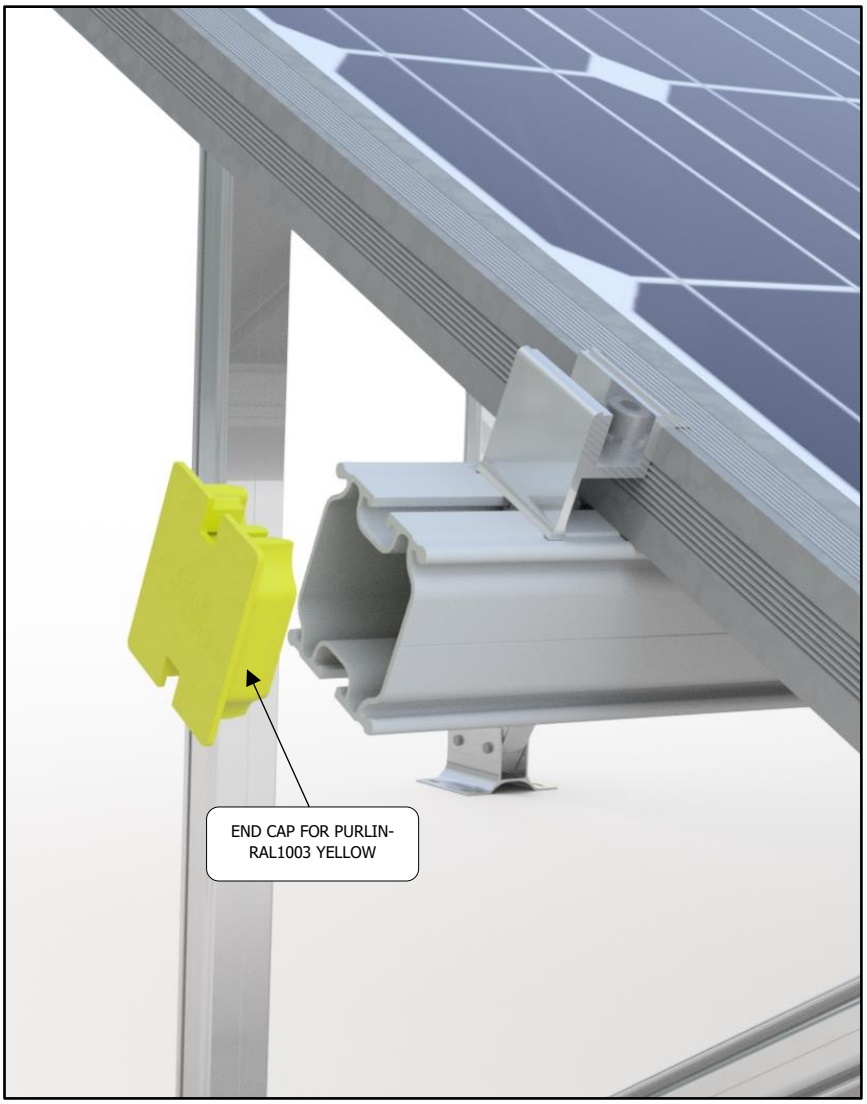


DETAIL H

Note: It is important to follow the manufacturer's specifications and guidelines for the installation of the PV modules, clamps, and other components, as these will vary based on the specific application and requirements. Failure to properly install these components can result in damage or failure of the system.

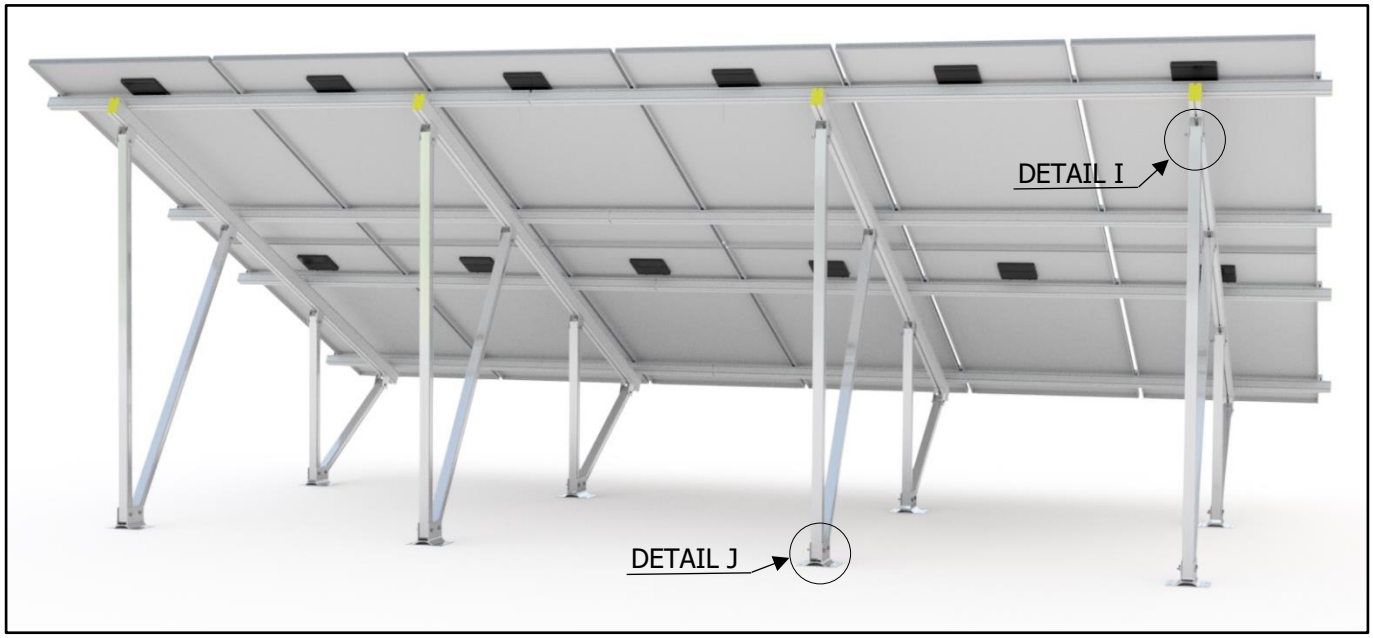
➢ Placing end cups for purlins

Install the yellow plastic caps at the end of the rails, with four caps for one side of the table and four caps for the other side.

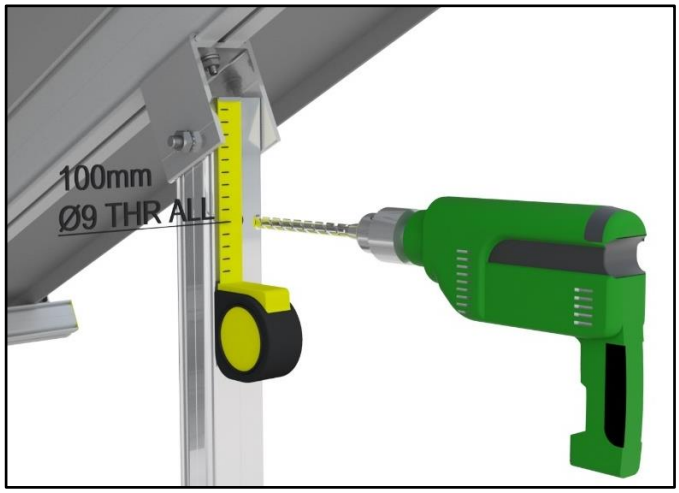


➢ Mounting Windshields (optional)

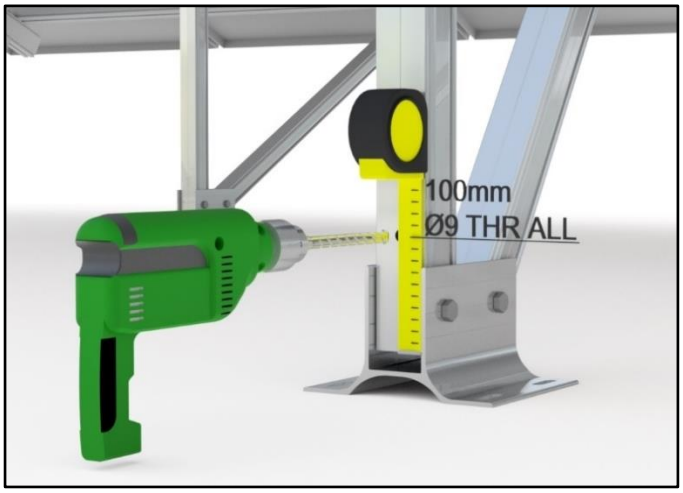
After finishing the installation of a table, place the windshields at the back of structure.



We drill a hole with a diameter of 9mm through the center, 100mm away from the edge.

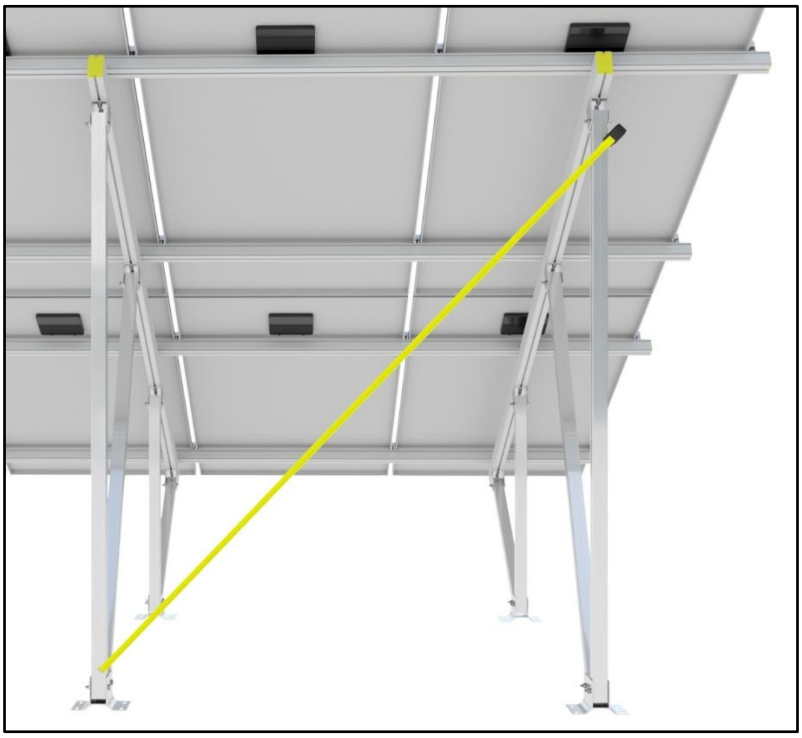


DETAIL I



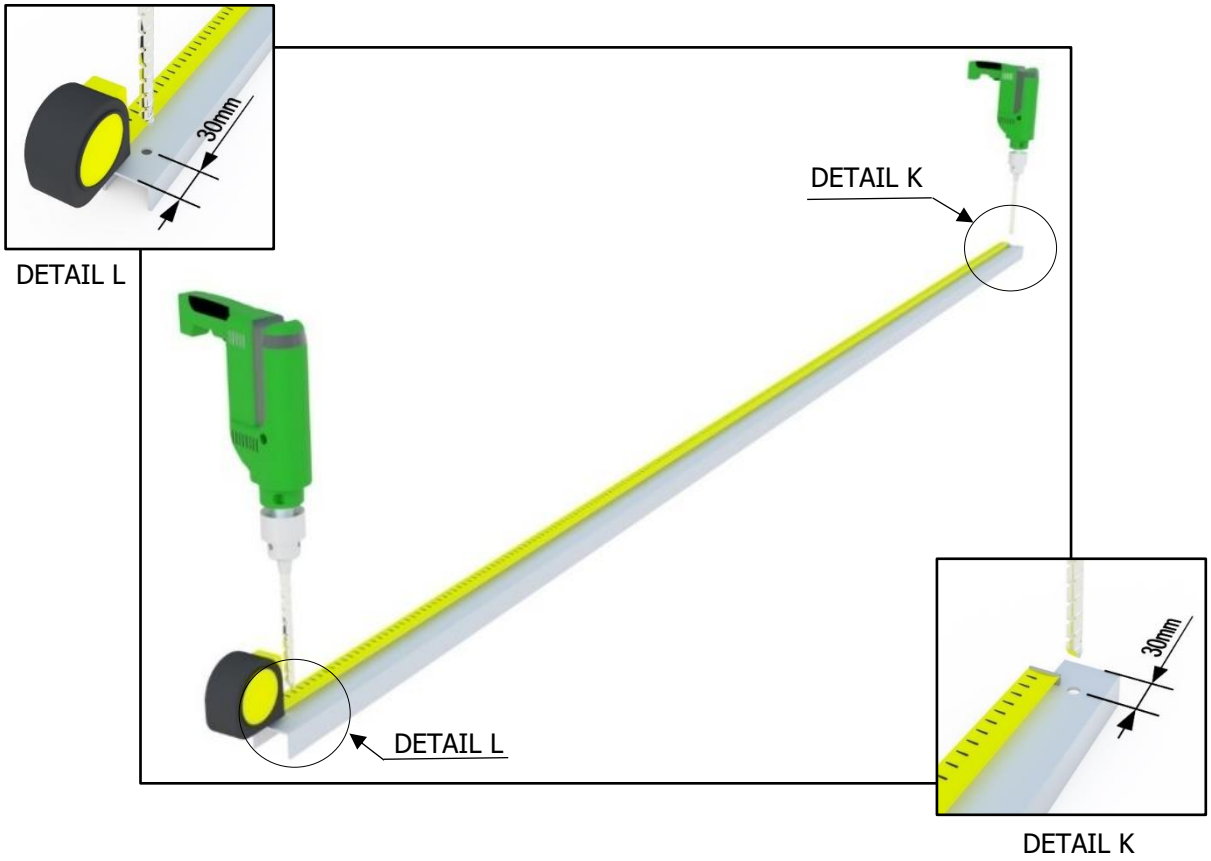
DETAIL J

The measurement of the holes can be done.

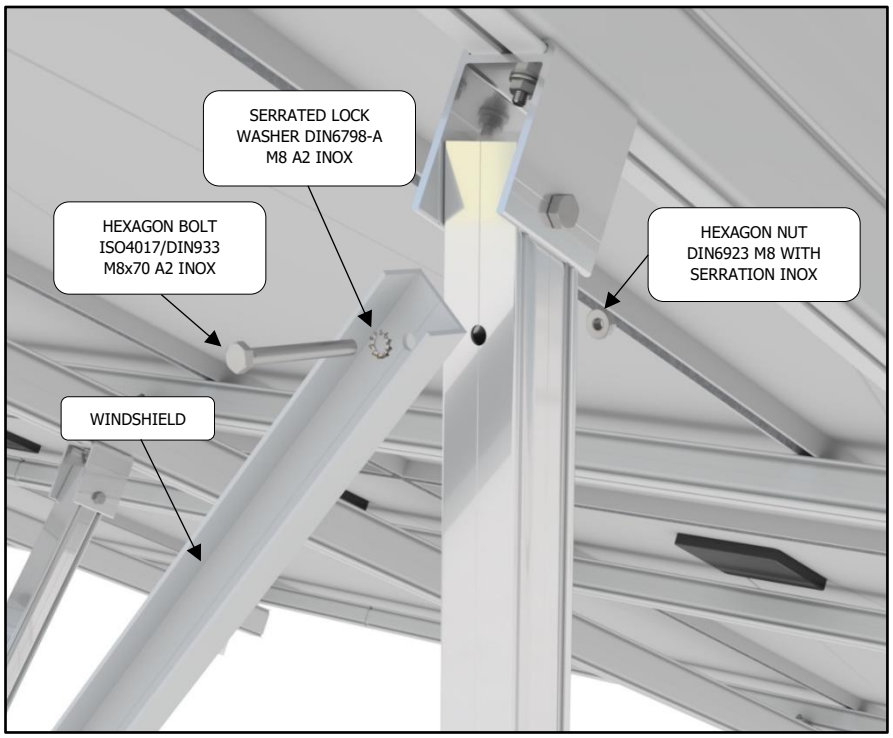


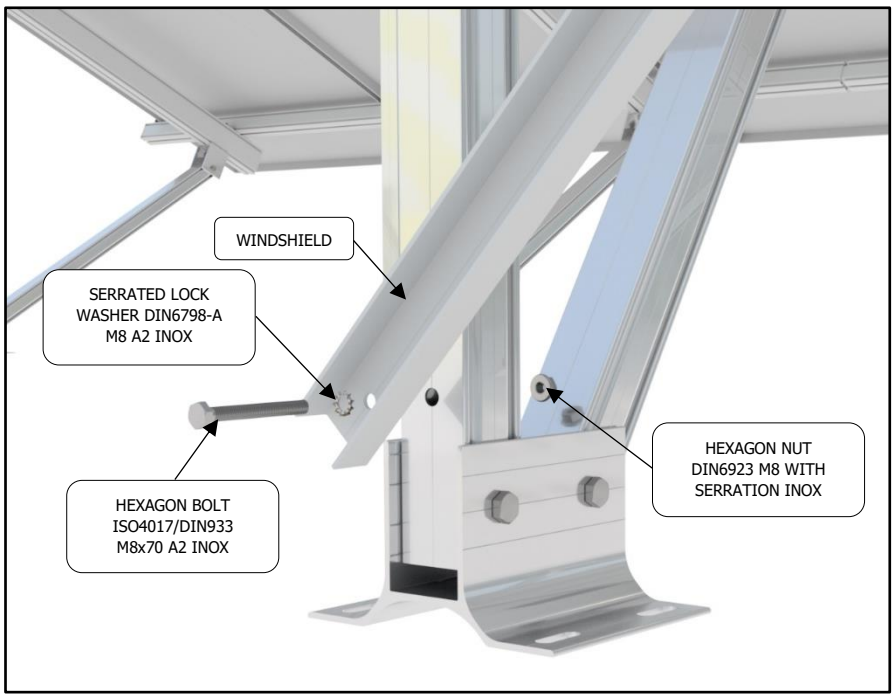
And then we drill the aluminum profile windshield. The holes have a diameter of 9 millimeters

The hole from the edge of the profile should be greater than or equal to 30 millimeters.

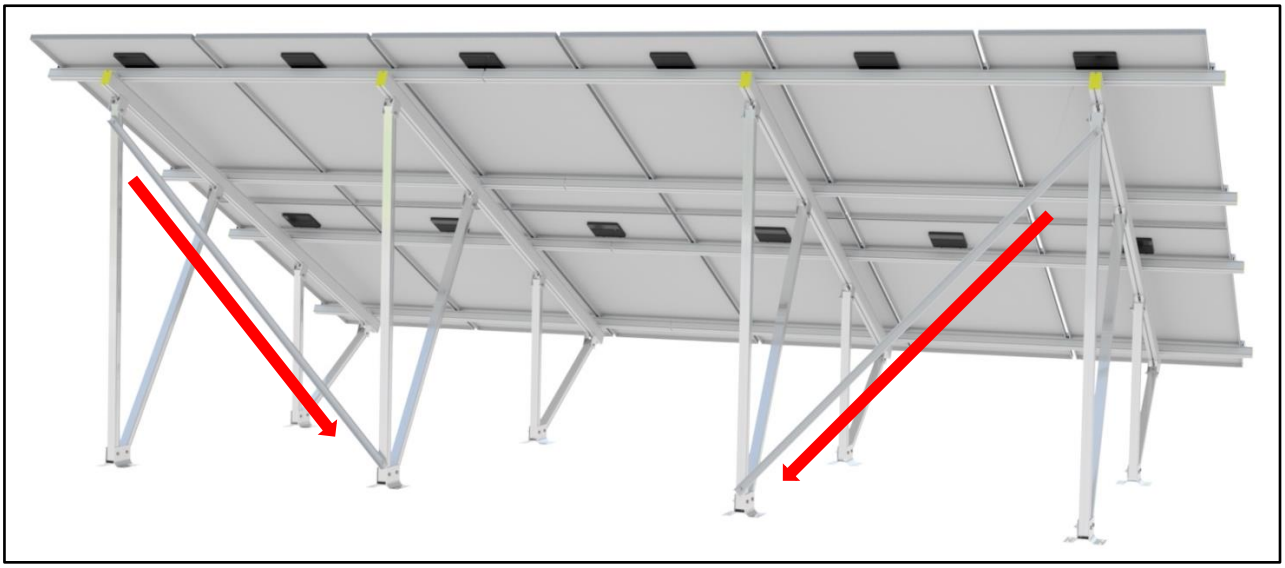


We place profile windshield in the column and secure it with the hexagon bolt M8x70, a M8 serrated lock washer and hexagon nut M8 with serration.





A complete installation with windshields.



C. MAINTENANCE

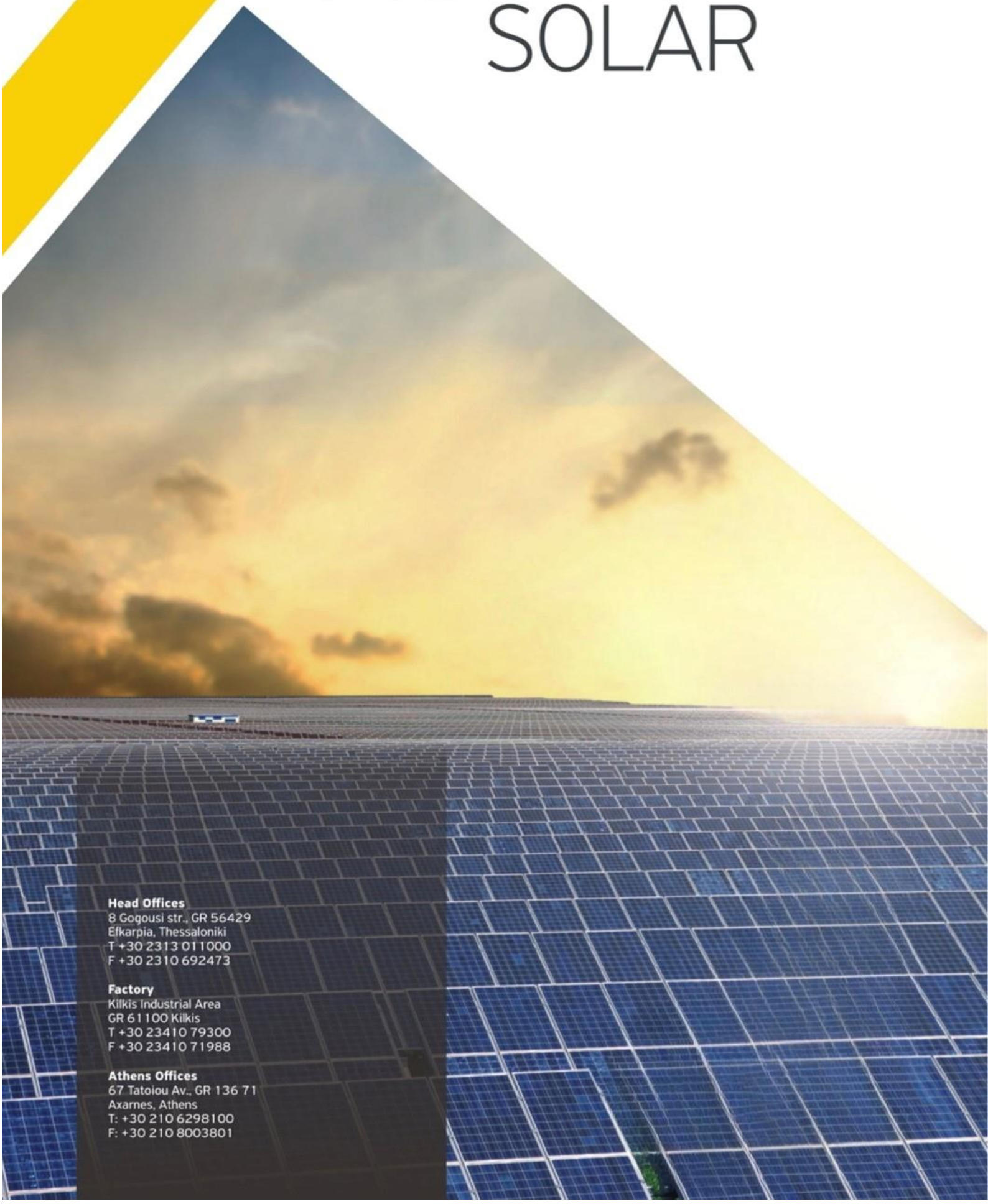
The PV mounting structures of ALUMIL S.A are designed in accordance with the European Standards (Eurocode 1, 3, 9) and do not require any special attention. ALUMIL also offers certified aluminum PV mounting structures made from durable aluminum alloy (Al 6005T6).

However, regular maintenance is recommended to maintain the high quality and longevity of the structures.

During site inspections, it is advisable to pay close attention to areas such as joints and holes. Specifically, the following checks are recommended:

- *Inspect bolted joints annually and replace them if bolt corrosion is detected.*
- *Periodically check the torque of bolted joints (every 1-2 years).*
- *Verify the torque on panel clamps every 6-9 months or after severe weather conditions to ensure the installation and torque settings remain accurate. Torque specifications can be found in the installation manual.*
- *Inspect aluminum and plastic components for any deformations and replace any deformed parts as needed (every 2 years).*
- *For locations close to sea level (<150m), it is important to clean the structures with water (no pressure) to prevent salt corrosion (annually).*
- *If snow accumulates, the panels must be cleared within 2 days of being fully covered to avoid freezing. Remove the snow without allowing it to freeze.*

Alumil SOLAR



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